

# **- Acquisition M&S Master Plan**

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## **A Progress Report to DS System-of-Systems Architecture Modeling Review**

**Fred Myers**  
**September 22, 2005**  
**Principal Assistant**  
**OUSD (AT&L) DS/SE/DT&E**  
**and**  
**Chair**  
**Acquisition M&S Working Group**

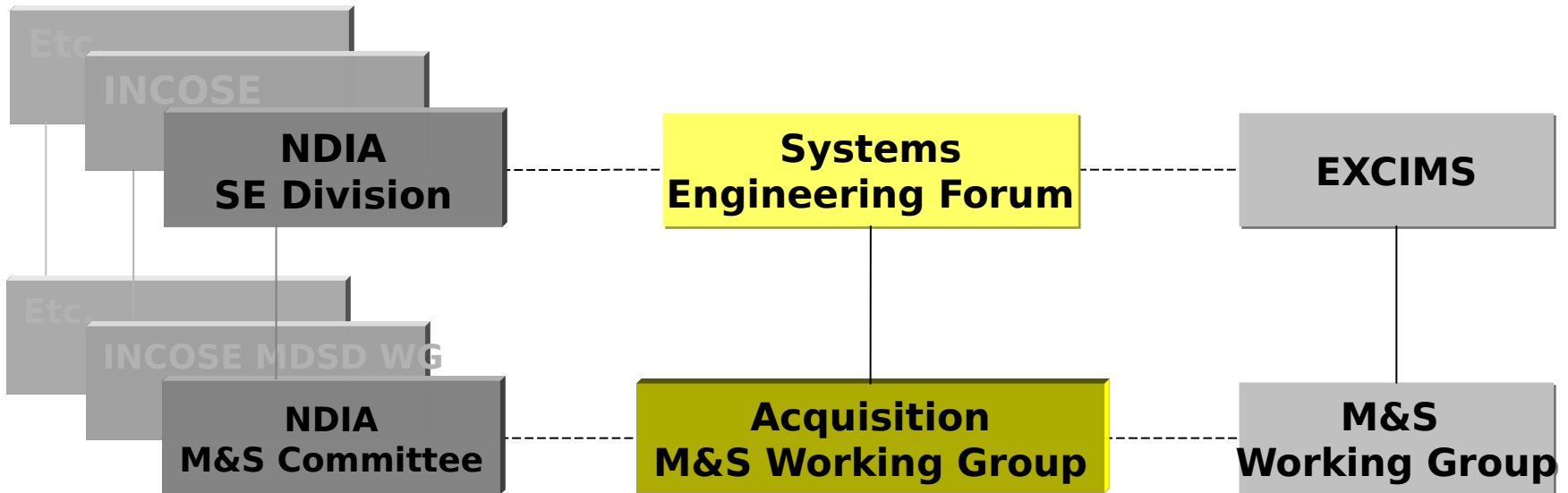
# Stood Up Acquisition M&S Working Group

July 15, 2004

## Industry / Academia

## DoD SE

## DoD M&S



## Products

***Reports (e.g., "M&S Support to the New DoD Acq. Process"), standards, papers, etc.***

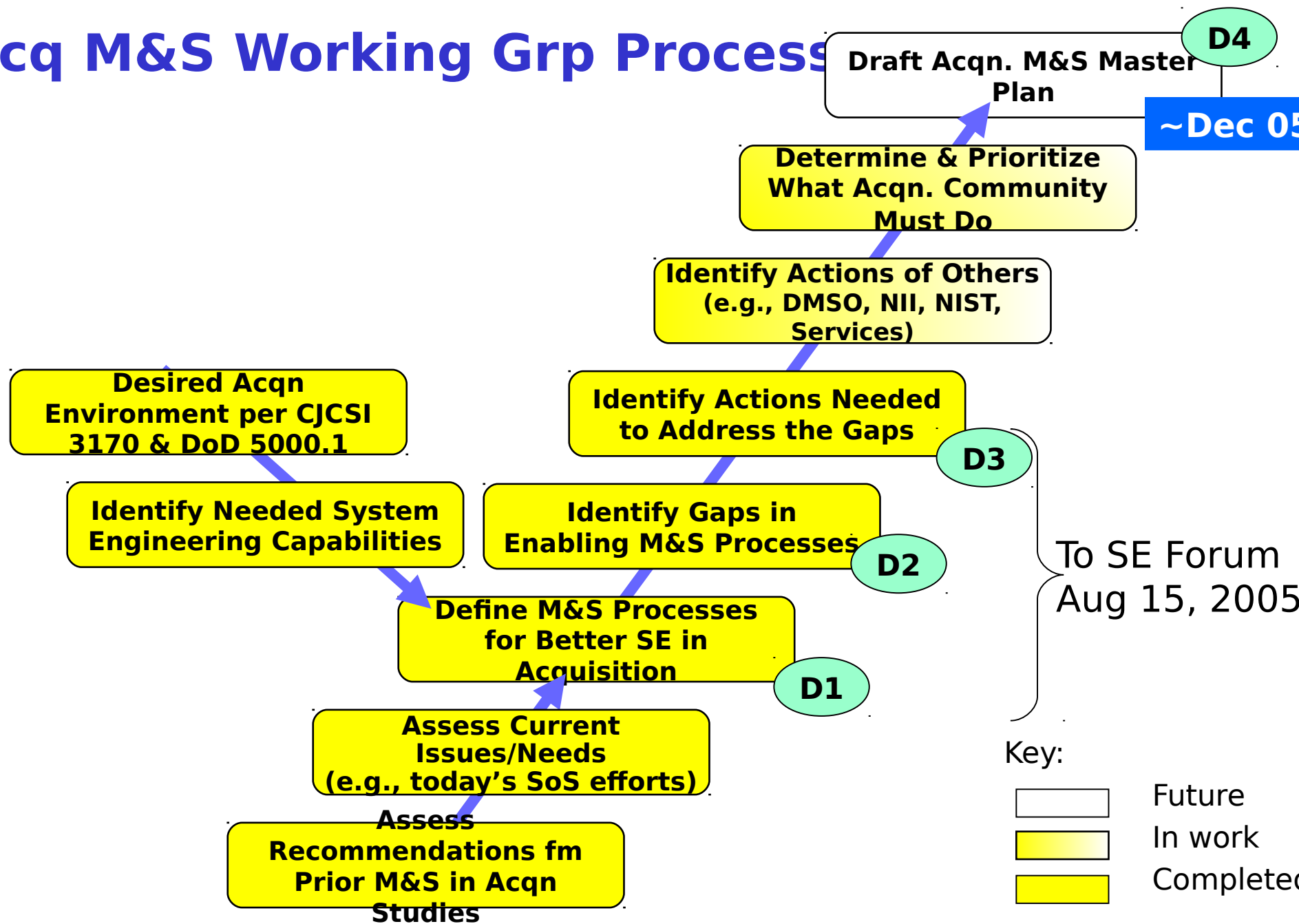
## Product

***Acquisition M&S Master Plan***

## Product

***DoD M&S Master Plan***

# Acq M&S Working Grp Process

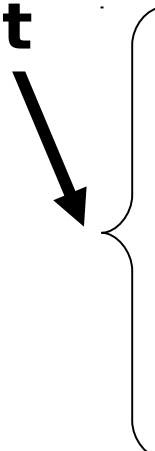


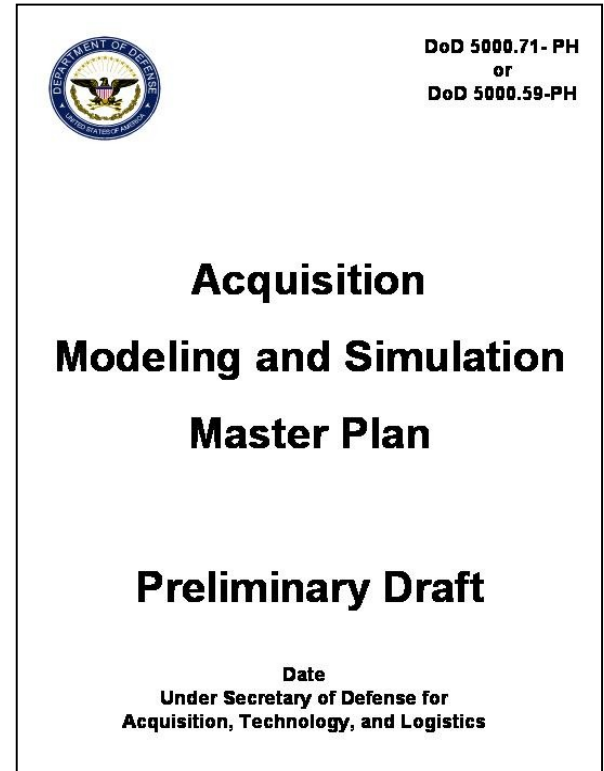
# Sample of M&S Failings

- ❑ Little reuse (or sharing) of M&S & data; hard to discover reusable resources; insufficient info to evaluate reuse candidates; no incentives to re-use
- ❑ No contractual guidelines for M&S and data needs
- ❑ No DoD requirement for formal M&S planning to support acquisition
- ❑ Lack of agreed standards for interchanging information
- ❑ No conceptual framework (like Open System Interconnect protocol stack) for data interchange
- ❑ Many M&S tool gaps and deficiencies
- ❑ M&S developers - not M&S users - tend to drive M&S development
- ❑ No readily-available L-V-C distributed environment
- ❑ VV&A often weak or non-existent; documentation inconsistent
- ❑ No business model for developing, using, maintaining M&S capabilities
- ❑ Acqn community managers (and staffs) mostly uninformed about M&S capabilities and limitations
- ❑ Body of knowledge for M&S support to acquisition is deficient, not managed

# Content of Acquisition M&S Master Plan

- **Forward**
- **Purpose**
- **Background**
- **Vision**
- **Objectives (5)**
- **Actions (34)**
- **Execution Management**

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- Rationale
  - Discussion
  - Lead & Support Organizations
  - Product
  - Completion Goal



# Objectives & Actions


## ❑ 5 Objectives

- 1: Provide Necessary Policy & Guidance
- 2: Enhance the Technical Framework for M&S
- 3: Improve Model & Simulation Capabilities
- 4: Improve Model & Simulation Use
- 5: Shape the Workforce

## ❑ 34 Actions

- ✓ Highlighted 11 actions likely to be of most interest to DS SoS architecture modeling review team

# Objective 1: Provide Necessary Policy & Guidance

 (Preamble) Need to assign responsibility for management of the joint capability areas, to include systems engineering and its M&S component

1. Provide effective, persistent DoD-wide M&S management to address cross-cutting M&S issues, coordinate actions

**Lead:** AT&L/DDRE; **Support:** AT&L/DS, other DoD Components

**Products:** Revised DoDD 5000.59 (M&S Management) with clearer responsibilities, revised EXCIMS membership, SOP for EXCIMS processes, a refocused DMSO

**Completion goal:** 2006

2. Publish practical guidelines for security certification of M&S activities falling under multiple Information Assurance Defense Accreditation Authorities

**Lead:** ASD(NII); **Support:** AT&L/DS, NSA

**Products:** Guidelines published in DoD 8500.2-H, per DoDI 8500.2 "Information Assurance Implementation," Feb 6, 2003

**Completion goal:** 2007


3. Establish policy to require documented M&S planning at the joint capability & program levels as part of the Systems Engineering Plan, T&E Strategy and T&E Master Plan

**Lead:** AT&L/DS; **Support:** DOT&E, Components

**Products:** Revised policy and guidance in DoDI 5000.2 and DAG

**Completion goal:** 2006

# Obj. 1: Provide Necessary Policy & Guidance (cont.)

4. Establish policy on appropriate use of M&S to plan tests, to complement system live tests, and to evaluate joint capabilities  
**Lead:** AT&L/DS; **Support:** DOT&E, Components  
**Products:** Revised policy and guidance in DoDI 5000.2 and DAG  
**Completion goal:** 2006
5. Establish guidelines for M&S-related RFP language & contract provisions  
**Lead:** AT&L/DS; **Support:** AT&L/DP, Components  
**Products:** (1) Sample language in DAG regarding M&S requirements, data rights, and the responsibilities and liabilities of parties regarding sharing and reuse; (2) update to Contracting for Systems Engineering Guidebook  
**Completion goal:** 2006
6.  Promote model-based systems engineering (MBSE) and M&S-enabled collaborative environments, at both the program and joint capability level  
**Lead:** AT&L/DS; **Support:** Components  
**Products:** Revised guidance in DAG  
**Completion goal:** 2007
7. Establish policies to require DoD-wide standardized documentation of VV&A  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, Components  
**Products:** Updated DODI 5000.61; revised policy and guidance in DoDI 5000.2 and DAG  
**Completion goal:** 2007



## Objective 2: Enhance the Technical Framework for M&S

8. ✓ Establish a framework for data interchange-related standards  
**Lead:** ASD(NII); **Support:** AT&L/DS  
**Products:** Revised guidance in NII policy documents  
**Completion goal:** 2008
9. ✓ Develop a product development information metamodel & associated metadata extensions to the DoD Discovery Metadata Specification  
**Lead:** AT&L/DS; **Support:** ASD(NII), Components  
**Products:** Revised DDMS; revised guidance in DAG.  
**Completion goal:** 2008
10. ✓ Support development of OMG's SysML and ISO Standard 10303 AP-233, which are open commercial systems engineering-related standards  
**Lead:** AT&L/DS; **Support:** ASD(NII)  
**Products:** Published standards suitable for adoption by DoD  
**Completion goal:** 2007
11. ✓ Establish a forum to clarify the characteristics and application of various distributed simulation standards (HLA, TENA, DIS, SI3, etc.); examine opportunities for convergence  
**Lead:** AT&L/DDRE **Support:** AT&L/TRMC, AT&L/DS; DOT&E; Components  
**Products:** (1) Information on strengths & weaknesses of the various standards; (2) agreement on policy and/or guidance on the use of distributed simulation standards; (3) a way ahead regarding distributed simulation standards  
**Completion goal:** 2007

## Obj. 2: Enhance the Technical Framework for M&S (cont.)

- 12 ✓ Develop the Acquisition Overlay (profile) for DoDAF v2.0
  - Lead:** AT&L/DS; **Support:** ASD(NII), Components
  - Products:** Acquisition Overlay for DoDAF v2.0
  - Completion goal:** 2006
- 13 ✓ Support the development of open commercial standards for use in the development and interchange of DoDAF-compliant architectures
  - Lead:** ASD(NII) **Support:** AT&L/DS
  - Products:** Revised standards in DoDAF 2.0; revised guidance in DAG
  - Completion goal:** 2007
- 14 ✓ Establish a standard template of key characteristics (metadata) to describe reusable M&S resources
  - Lead:** AT&L/DDRE **Support:** AT&L/DS; AT&L/TRMC, DOT&E; Services
  - Products:** Published standard template; usage guidance in DAG
  - Completion goal:** 2007

# Objective 3: Improve Model & Simulation Capabilities

15. Develop risk-based methodology and associated guidelines for VV&A expenditures  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, Components  
**Products:** Updated DMSO VV&A Best Practices documents/web site; guidance in DAG  
**Completion goal:** 2006
16. Establish a process to ensure acquisition needs are reflected in DoD M&S priorities, including S&T  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS  
**Products:** Incorporate in M&S requirements process (ref: DoD M&S Master Plan) a method to capture and prioritize those acquisition needs.  
**Completion goal:** 2007
17. Define and foster best practices for efficient development and evolution of credible M&S tools, incorporating user-defined requirements, a systems engineering approach, and appropriate V&V  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, Components  
**Products:** Best practices DMSO publication, available via MSIAC, etc.; DAG guidance to use  
**Completion goal:** 2008

## Obj 3: Improve Model & Simulation Capabilities (cont.)

18. Enable readily-available distributed live-virtual-constructive environments, leveraging related initiatives

18-1. Establish DoD-wide standards for distributed environments

**Lead:** AT&L/DDRE; **Support:** AT&L/TRMC, AT&L/DS; DOT&E; Components

**Products:** Published standard; DODI (# TBD) policy to use

**Completion goal:** 2008

18-2. Make candidate simulations, labs and ranges compliant with these standards (per **Action 22** business model)

**Lead:** DoD Components; **Support:** AT&L/DS, AT&L/TRMC

**Products:** Toolkit of live, virtual and constructive representations ready to be employed in distributed events

**Completion goal:** 2009

18-3. Provide services to help plan and conduct distributed events

**Lead:** DoD Components; **Support:** AT&L/TRMC, AT&L/DDRE, DISA

**Products:** Fee-based technical services to help users (e.g., PMs, Capability Managers, OTAs) plan and conduct distributed events

**Completion goal:** 2009

## Obj 3: Improve Model & Simulation Capabilities (cont.)

19. Centrally develop and maintain high-priority, broadly-needed M&S tools

19-1. Identify and prioritize broadly-needed M&S tools (ref: Action 16)

**Lead:** AT&L/DDRE; **Support:** AT&L/DS; Components

**Products:** Prioritized list of common M&S needs

**Completion goal:** 2007

19-2. Conduct one or more pilot projects to develop new tools and/or update existing ones to meet these needs

**Lead:** AT&L/DDRE; **Support:** AT&L/DS, Components, JACG

**Products:** Proof of concept for managing the development/evolution of M&S tools to meet broadly-shared needs

**Completion goal:** 2009

19-3. Expand the scope of central M&S tool management as warranted by pilot project results and the list of common M&S needs

**Lead:** AT&L/DDRE; **Support:** AT&L/DS, DoD Components

**Products:** Optimal means to meet common needs for M&S tools

**Completion goal:** 2011

## Objective 4: Improve Model & Simulation Use

20. Provide potential M&S users the knowledge needed to formulate an effective M&S strategy via ready access to M&S expertise and information about M&S capabilities and gaps, reusable resources, lessons-learned, etc.

**Lead:** AT&L/DS; **Support:** AT&L/DDRE

**Products:** Revised guidance in DAG; improved knowledge base in MSIAC; assist visits (e.g., by AT&L/DS)

**Completion goal:** 2007

21. Define best practices for disciplined M&S planning & employment
- Rigorous analysis of M&S requirements and alternative solutions, selection of best course
  - Efficient configuration management, initialization, execution and post-run analysis
  - Cautions against inappropriate use; approaches to maximize cost-effective reuse across lifecycle

**Lead:** AT&L/DS, **Support:** AT&L/DDRE, Components

**Product:** Revised best practices guidance in DAG and MSIAC

**Completion goal:** 2007

## Obj. 4: Improve Model & Simulation Use (cont.)

22. Establish a DoD-wide business model for compensating providers of reusable M&S resources (e.g., information, tools, services)  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, OUSD(P&R), OUSD(PA&E), Components  
**Product:** Documented business model; revised policy and/or guidance in DoD 5000 series and DAG  
**Completion goal:** 2007
23. Establish DoD policy and/or guidance regarding responsibilities to share, protect and properly use information and M&S tools  
**Co-Leads:** ASD(NII) and AT&L/DDRE; **Support:** AT&L/DS, AT&L/DP, OUSD(P&R), OUSD(PA&E), Components  
**Product:** Revised policy and/or guidance in various issuances, e.g., DoD 5000 series, DAG, contracting guidance  
**Completion goal:** 2007
24. Enhance the means (e.g., directory service, registries, bulletin boards) to discover existence of reusable resources required for M&S and contact info  
**Lead:** AT&L/DDRE **Support:** AT&L/DS, OUSD(P&R), OUSD(PA&E), Components  
**Product:** Functional means, with appropriate resources and incentives, and a continuous improvement process  
**Completion goal:** 2007

## Obj. 4: Improve Model & Simulation Use (cont.)

✓ 25. Define the types of information DoD organizations shall make available to others with a valid need to know and the processes to obtain them (per **Action 22** business model)

### 25-1. Scenario data

**Lead:** AT&L/DDRE **Support:** CJCS(J8), OUSD(PA&E), DIA, Components

**Product:** Approved scenarios and process to obtain

**Completion goal:** 2007

### 25-2. System data

**Lead:** AT&L/DS; **Support:** Components

**Product:** Authoritative system data and process to obtain

**Completion goal:** 2007

### 25-3. Threat data

**Lead:** DOD MSEA for Threat Data; **Support:** AT&L/DDRE, AT&L/DS, Components

**Product:** Authoritative threat data and process to obtain

**Completion goal:** 2007

### 25-4. Natural environment data

**Lead:** DoD Natural Environment MSEAs; **Support:** AT&L/DDRE, AT&L/DS, Components

**Product:** Authoritative natural environment data and process to obtain

**Completion goal:** 2007



# Obj. 4: Improve Model & Simulation Use (cont.)

- ✓ 26. Assess the use of COTS systems engineering tools (modeling environments) for collaborative architecture development  
**Lead:** AT&L/DS; **Support:** OASD(NII), Components  
**Product:** Use results to enhance the M&S body of knowledge (DAG, DAU courses, etc)  
**Completion goal:** 2006
27. Define and capture meaningful metrics for M&S utility in acquisition  
**Lead:** Navy; **Support:** AT&L/DS, Components  
**Product:** Defined process and metric definitions in DAG; metrics from individual projects in MSIAC  
**Completion goal:** 2007
28. Examine a program's VV&A when M&S informs major acquisition decisions and unambiguously state the purpose, key assumptions and significant limitations of each model/simulation when results are presented.  
**Lead:** AT&L/DS **Support:** DoD Components  
**Products:** Guidance and training for oversight personnel; updates to DAG Chaps 4 & 9  
**Completion goal:** 2006

## Objective 5: Shape the Workforce

29. Define required M&S competencies for the acquisition workforce  
**Co-Leads:** DAU and AT&L/DS; **Support:** AT&L/DDRE, OUSD(PA&E), OUSD(P&R), Components  
**Product:** Identified lead FIPT; workforce qualification requirements; management process & structure  
**Completion goal:** 2008
30. Harvest lessons from commercial sector activities in the use of M&S to support product development  
**Lead:** AT&L/DS; **Support:** AT&L/DDRE, Components  
**Products:** Annual update to best practices in DAG of lessons from industry that should be considered by PMs in planning for M&S  
**Completion goal:** Recurring; initial in 2007
31. Collect and enhance the M&S body of knowledge  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, Components  
**Product:** Information of value to M&S users (e.g., PMs, CMs, OTAs)  
**Completion goal:** Recurring; initial in 2007

## Obj. 5: Shape the Workforce (cont.)

32. Incrementally deliver the body-of-knowledge via an expanded set of DAU courses, PME, Acquisition Guidebook, and on-line CLMs  
**Lead:** DAU; **Support:** AT&L/DS, Components, AT&L/DDRE  
**Product:** Expanded set of DAU courses, PME, Acquisition Guidebook, and on line CLM  
**Completion goal:** 2009
33. Incrementally deliver M&S body-of-knowledge via conferences, workshops, and assist visits  
**Lead:** AT&L/DS; **Support:** DAU, AT&L/DDRE, Components  
**Product:** Annual outreach program  
**Completion goal:** Recurring; initial in 2006
34. Improve the knowledge and expertise available through the MSIAC to make it of greater utility to the acquisition community  
**Lead:** AT&L/DDRE; **Support:** AT&L/DS, OUSD(P&R), OUSD(PA&E), Components  
**Product:** Plan of action with coordinated MSIAC CONOPS & staffing requirement; list of knowledge shortfalls that MSIAC will take on; success criteria & process to bring MSIAC up to criteria  
**Completion goal:** 2008

# Next Steps

- ❑ Broadly vet actions (DoD, Industry)
  - Fine-tune actions, lead & support, products
- ❑ Finalize Acquisition M&S Master Plan
  - Acq M&S Working Group consensus
  - SE Forum approval (Dec 2005)
  - Informal DoD coordination
  - USD(AT&L) release for formal coordination
  - USD(AT&L) approve plan
- ❑ Implement plan
- ❑ Assess impact (metrics)